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## Engaging College Students in the Transition to Sustainability Through Design-Based Approaches

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### **Abstract**

To achieve social change towards sustainable ways of living, it is essential to promote a culture of sustainability among young people. Universities have a very important role, as sustainable education on college campuses has the potential to achieve long-term results by promoting the development of awareness and skills for youth engagement in order to face complex challenges, now and in the future. This study investigates the application of design-based thinking and participatory design to support a culture of sustainability among youth. It aims to bridge the value-action gap and to develop sustainable competencies. Design-based strategies integrated within educational experiences promote dealing with change and complexity, as well as offering a range of potentialities and interfaces for innovative action in the transition to sustainability. This research used a qualitative multi-method approach which consisted of a literature review, context analysis, ethnographic observation, and application of participatory design in educational settings in Brazil and the United States. This paper summarizes preliminary findings, including guidelines for engagement strategies. These reinforce the importance of understanding values and challenges of youth development, exploring dimensions of sustainability connected to student realities, building contexts for transformation, stimulating empowerment and autonomy, and using mediation to facilitate change processes conducted by young people. These findings also demonstrate that design-based participatory approaches in educational settings offer excellent opportunities for intervention to both engage youth in sustainability and support their positive development.

**Keywords:** Culture of Sustainability, Youth, Universities, College Students, Bridging the Value-Action Gap, Engagement, Design for Sustainability, Participatory Design

## Introduction

The transition to sustainability is a long-term goal for human society and will necessarily take place over time, as we are faced with a tremendous challenge of unprecedented scope, scale, and complexity (Unesco 1997). Shifting towards sustainable living constitutes a process of social learning, hence the social responsibility of all institutions to promote a culture of sustainability, beginning with the local contexts and challenges. It is especially important to promote healthier, sustainable, and integrated lifestyles for newer generations. Fostering a culture of sustainability among young people is a key strategy, allowing them to develop processes and interaction strategies to create 'contexts for change'.

The initial motivation for this research came from difficulties found in sustainable education projects developed in Brazil, especially on how to spark interest and engagement among young people. Traditional speech tools and models seemed to be ineffective in terms of mobilization, as they did not relate to students' imaginary and lived experiences. Although the ecological impacts and the need for change are understood, they remain general and abstract ideals (and are often generators of anguish) because it is difficult for young people to connect them to their everyday lives.

In this context, the field of design offers a range of potentialities and interfaces for innovative action. Design principles and practices may contribute to creative innovation and support promising initiatives on sustainability, offering skills, abilities, methodologies, and a unique viewpoint (Mouchrek, 2014). This study aims to investigate the process of change and engagement in sustainability among youth. Furthermore, this article explores the potential of design to support interventions to bridge the value-action gap in sustainable behavior and develop sustainable competencies, especially in the context of higher education.

The paper summarizes results from the first part of the research project, developed for a master's degree (Brazil, 2012-2014), and shares preliminary results of the second part, currently in development for an interdisciplinary PhD (United States, 2015-present). The main content presented in this paper includes:

- 1) Interdisciplinary literature review on themes such as the culture of sustainability, design as an agent of sustainable change, and the role of universities in the transition.
- 2) Analysis of key aspects and proposition of a set of guidelines for strategies to promote the culture of sustainability among young people – developed in search of priority areas and possible approaches for intervention in the field
- 3) Investigation of the potential of design-based approaches to promote engagement in sustainability among students.

## Promoting a cultural shift regarding sustainability

The concept of sustainability encompasses several dimensions, as it regards living conditions and organization of society as a whole. Sachs (2004) identifies eight

dimensions of sustainability: social, cultural, ecological, environmental, territorial, economic, and political. In this research, the focus is on socio-cultural and educational dimensions. Culture is an inextricable part of the complex notion of sustainability, being a very practical, concrete determinant in this process (Unesco 1997).

The transition towards sustainability constitutes a widely diffuse process of social learning through a systemic transformation (Manzini 2008). It is a complex process requiring society-wide shifts in priorities and perspectives (Stephen et al. 2008). It is imperative to implement a cultural shift in how individuals and society address economic, social, and environmental issues, developing a *culture of sustainability* (Duxbury and Gillette 2007).

The idea of promoting a *culture of sustainability* encompasses all the factors of sustainability, since culture embodies the meaning people give to their lives, the values they share, and how they express their vision for the future, to be conveyed to future generations (Hawkes 2001). This cultural change necessarily encompasses a radical re-evaluation of the hierarchy of values that give meaning to life and determine society's priorities (Brown 1981). Behavior shifts come from a process of awareness, collective responsibility, and strengthening autonomy.

Lifestyle changes will need to be accompanied by a new ethical awareness (Unesco 1997). To this end, it is important to develop innovative approaches to evolve into more sustainable and conscious lifestyles, particularly among young people. It is especially regarding the new generations that the changes towards healthier, integrated and sustainable lifestyles are fundamental. Young people are the core of our present and the key to determining if there will be a future (Canclini 2007). The young person carries in him/herself, in an intensified way, the problems of our civilization: youth is simultaneously the weak link (for its weak sociological presence) and the strong link (for its energy) of our society (Morin 2012).

In the near future, this generation will need leaders and citizens who think ecologically, understand the interconnectedness of human and natural systems, and have the will, the ability, and the courage to act (Stone 2009). As Autio and Heinonen (2004, p. 150) emphasize: "young people need to reflect on the future of the world and what is the meaning of 'good life' for them. They are the future consumers, producers and agents of change. "

Engaging young people in cultural and social sustainability generates positive outcomes for both youth development and community change (Browne et al. 2011), allowing them to develop an optimistic and proactive outlook for the future (Duxbury and Gillette 2007). The ability to understand and seek meaning in their experiences and choices will be a key attribute for young people in this process. Developing competencies such as critical thinking, autonomy, the ability to make choices, and the ability to envision new scenarios will also be important.

This study is built around the idea that it is essential to invest in and promote a culture of sustainability among youth. This includes developing tools and innovative strategies of interaction, embracing diversity, promoting skills to deal with the complexity and challenges of the near future, and preparing them to participate fully and actively in sustainable transformations in our society.

### **Behavioral change towards sustainability**

Authors observe a value-action gap regarding sustainable behaviors and social engagement, which may be attributed to a lack of appropriate information (Blake 1999). It is possible to observe other barriers to sustainable behavior, such as personal, structural, practical, and social matters (Jackson 2005; Blake 1999). Several authors state that expanding ecological information by itself will not be enough to overcome this gap (Sammer and Wüstenhagen 2006; Roizman 2001; Mouchrek 2014; Leitner et al. 2011; Autio and Heinonen 2004). Kollmuss and Agyeman (2002) propose a strategy including, among others, internal factors such as environmental awareness, responsibility, emotional involvement and motivation, and locus of control.

To bridge the value-action gap and encourage youth engagement in sustainability, it is fundamental to promote the key competencies (Barth et al. 2007) that enable reflection, participation, awareness, and engagement on sustainable development goals. This study aims to investigate key factors and potential strategies to bridge the value-action gap and promote engagement in sustainability and social change among young people, particularly college students.

### **Design as an agent of change for sustainability**

Among alternative methodologies to promote a culture of sustainability among youth, the field of design emerges with promising strategies to deal with transitional change and complexity. Design evolved from a specialized profession to an area of knowledge, through reflection on its practice and through the opening of new niches and levels. In addition to traditional areas of expertise, nowadays we can find great development in new interdisciplinary areas such as Human Centered Design, Design for Sustainability, and Design for Social Innovation.

Design is a dynamic process, comprising of the act of thinking, planning, and devising courses of action with a particular purpose (Friedman 2000). Design can be approached in various dimensions, among them: (a) a process and a set of projects and creative activities; (b) an active agent for problem solving, through the planning and implementation of actions to change existing situations into preferred ones (Simon 1982); (c) as an agent of mediation between diverse actors, to facilitate and support innovation (Krucken, 2008). There is a growing focus on design as a process and an alternate mode of inquiry within contemporary decision-making contexts. The design process is being applied as a tool to understand reality, formulate problems in new ways, and develop solutions that emerge from a collaborative process. Within this general trend of change of perspective, the field of Design is expanding and there is a growing focus on *design as a process* and *a strategic tool* (Cassim 2013). Design can be a powerful catalyst for sustainable change: acting in networks of multidisciplinary action, contributing to plural solutions and new scenarios (Krucken 2008), shaping conditions for the creative context (Landry, 2000), providing tools, equipment and infrastructure for innovative practices (Malaguti 2009), and leading convergence towards shared ideas and potential solutions

(Manzini 2008).

This study focuses on *participatory design*: an approach to design which develops solutions that actively involve all stakeholders in the design process (Harder, Burford and Hoover 2013). The origins of participatory design date back to movements toward democratization at work in Scandinavian countries in the 1970s, starting from the political conviction that those affected by a design should have a say in the design process (Ehn 2008). At the core of the participatory approaches, there are a range of activities of co-creation. Co-design (or co-creation) describes a process that involves designers and those not trained in design working together to develop solutions (Sanders and Stappers 2008). It is a way of progressing through a problem or design scenario used as a means of, for example, attending to behavioral change (Kingsley 2009). Typical features of participatory design include collective construction of knowledge, mutual learning, prototyping, and iteration. Particularly regarding the promotion of the culture of sustainability among youth, it is relevant to investigate design's potential and interfaces of action in order to propose and support creative paths for innovative practices in the field.

### **Role of higher education in building a sustainable society**

The changes required in the process of social learning in the transition to sustainability will be performed via active participation of competent citizens (Barth et al., 2007). Awareness and competences in sustainability are increasingly necessary in the constitution of citizenship and social engagement. Thus, it is vital that all institutions (especially those of higher education) recognize their responsibility to promote a culture of sustainability.

With the potential to model sustainable practices for society and to promote awareness and engagement among students and extended communities, universities are at the forefront of the transition to sustainability. Sustainable education on college campuses has the potential to achieve long-term results by promoting the development of awareness and skills for youth engagement in order to face complex challenges, now and in the future. Strategically positioned to encourage synthesis and integration of different types of knowledge and to enhance the application of knowledge to social change, universities may facilitate social changes toward more deliberate societal engagement and to advance sustainable practices (Stephen et al. 2008).

Higher education can offer unique experiences for students to develop skills of integration, synthesis, systems-thinking, complex problem solving, and awareness of social responsibilities that are associated with professional practice, self-efficacy, and capacity for advocacy and interdisciplinary collaboration (Sibbel 2009, Stephen et al. 2008). Key competencies for sustainability include foresighted thinking, interdisciplinary work, cosmopolitan perception, transcultural understanding, participatory skills, planning and implementation, empathy, compassion and solidarity, self-motivation and motivating others, and objective reflection on individual and cultural models (Barth et al. 2007). The education for a sustainable living is also fundamental in the “whole person” education. Therefore, the opportunities to experience social engagement and mobilization in the context of

higher education show excellent potential to support personal and collective development. By investing in strategies to bring social and cultural sustainability aspects to day-by-day practices and academic settings, universities will be fulfilling their fundamental role in: (a) educating the next generations with the complex competences required; (b) being a privileged space for discussion and evolution of knowledge and practice (preferably through an open debate and not under a universal approach), and; (c) giving back to local communities and society with collective efforts towards sustainable systems and practices. The strategies and activities to promote the culture of sustainability implemented within the present study were developed in the context of higher education both in Brazil and the United States.

## Methodology

This research uses a qualitative multi-method approach, using concepts and tools from the field of design research and interdisciplinary knowledge to find patterns to understand and map contemporary and changing issues and to outline opportunities for intervention. We elaborated a composite of traditional procedures and research techniques (literature review, documentary research and content analysis, open and semi-structured interviews, and case studies) and other innovative procedures and tools of design research (rapid ethnographical research, participant observation, visual mapping, co-creation and collective construction of knowledge, and collaborative maps). These research activities were implemented in three different educational contexts, as follows.

### 1. *Youth Sustainability Management Group*

The first semester-long project was implemented in the Youth Sustainability Management Group at OiKabum! School of Art and Technology (Belo Horizonte, Brazil). Based on a model of democratic management, the school had student-led management groups, including the Sustainability Group. The group consisted of 8-10 students and was finding it difficult to communicate and mobilize their peers regarding sustainability in the school environment.

The co-creation process was developed in four stages: (a) Discussion of concepts of sustainability and aspects of communication and mobilization; (b) Creation of context for transformation, discussion of motivation and objectives; (c) Proposal for intervention in which a communication campaign was elaborated and published, and; (d) Validation, feedback from the community, and concrete change in behavior.

The initiative yielded very interesting results about youth engagement and authorship, strengthening of team spirit, and student relationships to public space. Along the way, an expanded vision of sustainability and innovative and interesting languages to communicate it were developed.

Figure 1 – Sustainability Group at OiKabum! School



Source: Mouchrek, 2014.

## 2. *Laboratory of Design, Co-creation, and Sustainability*

Next, a semester-long design laboratory focusing on open innovation in sustainability (UEMG-Brazil) was developed as an undergraduate course for 20-25 design students at the State University of Minas Gerais, Brazil. Following an experimental approach, the primary goal was promoting experimentation of strategies of co-creation and sustainability projects targeting youth, promoting competences for future intervention in contexts of transition towards sustainability.

The co-creation activities during the semester were meant to encourage students to interact collaboratively to develop, facilitate, and implement innovative solutions. In the beginning, a co-design activity focused on students' perception of youth and their context of development (*What does it mean to be young? What is the spirit of our time?*). Using design tools such as ideation, affinity diagramming, and visual maps, student groups created collective image boards (Figure 2). The whole group engaged in structured reflection and produced a synthesis map. The visual maps drawn up at the beginning of the process led to the emergence of an active debate among the students. They showed interest and a willingness to express their views, and produced a collaborative, complex profile of issues related to young people's realities and how potential design-based interventions could work to promote the culture of sustainability in a meaningful way for them. The experience with the laboratory is described in detail by Mouchrek & Krucken, 2018.

Figure 2 - Laboratory of Design, Co-creation, and Sustainability





Source: Mouchrek & Krucken, 2018

### 3. *Workshops in Intro to Sustainability Courses*

In the scope of an interdisciplinary introductory course on sustainability at Virginia Tech in the United States, two co-creation activities were developed (Figure 3). The first activity included approximately 60 students and prompted them to reflect on their values and create projections for the future (*What inspires me? Who is my future self, 5 years from now?*). Using ideation, group discussion, scenarios, and video, students revealed interesting intrinsic motivations and proposed diverse future trajectories, both personal and professional. The group shared insights about the relevance of starting to pursue strategies in the present in order to create conditions for the future contexts they designed for themselves.

The second activity was implemented in the second iteration of the course and asked a group of 20-25 students about their visions and potential strategies on sustainability (*How can we bridge the value-action gap in sustainability?*). Using affinity diagramming and synthesis maps, students vocalized their perceptions and criticism while envisioning solutions. The activity was considered an efficient way to summarize the content knowledge constructed in the class during the semester and to exercise students' critical thinking on the subject.

Figure 3 – In-class discussions in the introductory course on Sustainability.



Source: VT Archive

### **Preliminary results and discussion**

In this section, we present part of the findings of the research project, consisting of

- 1) An analysis of key aspects and proposition of a set of guidelines for strategies to promote the culture of sustainability among young people – developed in search for priority areas and possible approaches for intervention in the field
- 2) An investigation of the potential of design-based approaches to promote engagement in sustainability among students.



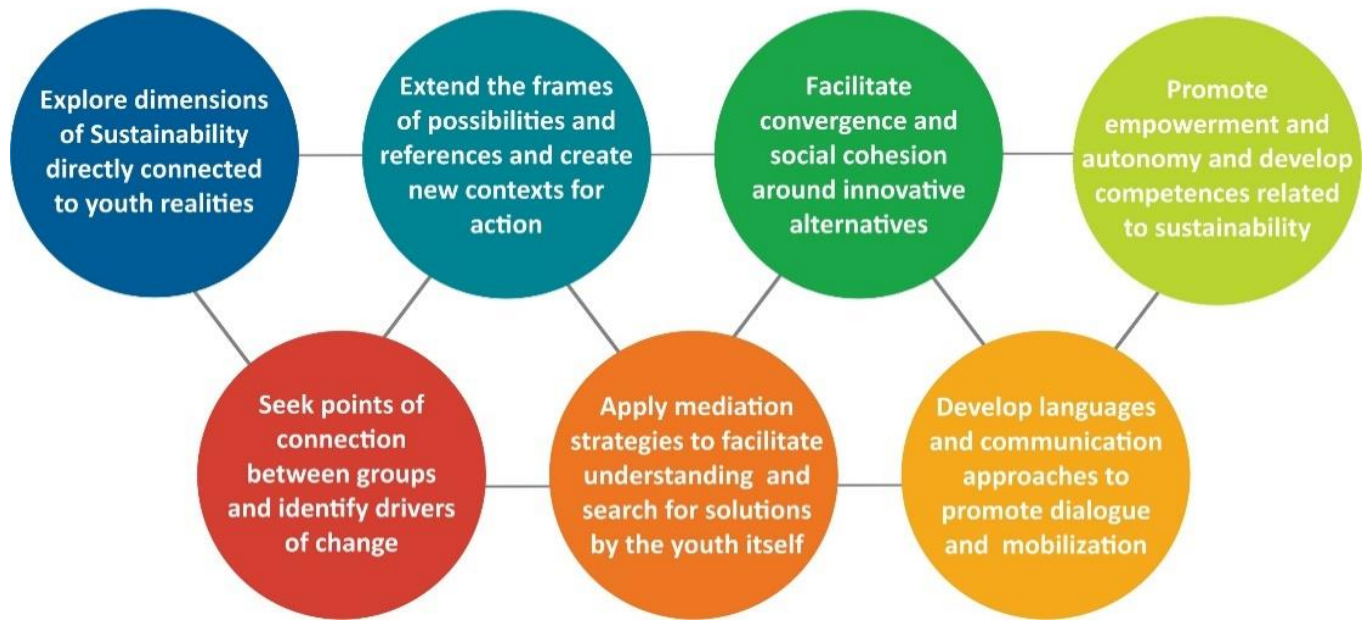
***Key aspects and guidelines for strategies to promote the culture of sustainability among youth<sup>1</sup>***

Youth development happens through learning in the course of action and experimentation. In this stage of life, this generation explores different values and positions in order to find and establish the values and principles that will underpin their adult life. Therefore, young people integrate sustainability as it relates to their personal situations in real life, with choices, decisions, school and professional orientations, balancing risk behaviors, and significant experiences. The process of behavior change toward sustainability and social engagement is complex and does not correspond to a linear model in which the ecological knowledge would lead to awareness and thus directly to action. The overall picture is complicated, and notions of citizenship and active social participation are diluted. Thus, it can be difficult for young people to devise for themselves an active role in the transformation towards sustainable ways of living. There is much evidence that highlights the need to provide new frameworks and foster the development of new skills to create a culture of sustainability. The following is a set of guidelines for strategies to promote the culture of sustainability among youth, developed as a result of this research:

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<sup>1</sup> This section present findings reported on the author's Master Thesis (Mouchrek 2014, in Portuguese).

Figure 4 – Guidelines for strategies to promote the culture of sustainability among youth.



Source: Author's own.

- *Explore dimensions of sustainability directly connected to youth realities.* It is recommended to develop more open and integrated sustainability approaches, preferably proposed by young people themselves, starting from reflection and discussions. These might involve contextualizing the issues into personal context and promoting ways to help them solve their own questions. Another approach might stimulate experiences through which they may constitute their own principles and motivations for action, individually and collectively.
- *Extend the frames of possibilities and references and create new contexts for action.* It is important to analyze the current contexts, frames of reference, and spaces for action available to young people. Is it possible to extend/develop/strengthen/redirect these contexts? It is necessary to open spaces and opportunities for experimentation, create new fields of action, find points of opportunity, and create innovative strategies from them. Proposing new policies and concrete actions allows young people to experience new possible identities and to reinvent social practices and social interactions.
- *Facilitate convergence and social cohesion around innovative alternatives.* Young people present positive and promising interests and characteristics that may be stimulated, supported, and strengthened in order to promote sustainable change. Among them we highlight: the interest and motivation to create innovative and original discourse and practices; a desire to participate, to belong to identity groups and shared initiatives; the will to exercise freedom

of choice; and a desire for autonomy and to create a significant professional and personal life. Therefore, it is necessary to facilitate convergence processes to foster social cohesion so that their choices and aspirations for change can become real and concrete alternatives.

- *Promote empowerment and autonomy and develop competences related to sustainability.* Empowerment is fundamental in the development of citizenship, because young people feel they can be agents of change and active subjects in problem-solving, developing autonomy and self-esteem. It is important to create pathways to stimulate their latent intention to act; reinforce their personal power; deepen the understanding of the impact of choices; and propose practical initiatives, allowing concrete experimentation and the feedback of peers. These strategies can generate relevant changes in youth participation and engagement while they promote the development of innovative attitudes, methods of action, and participation.
- *Seek points of connection between groups and identify drivers of change.* Each group has its own agents and drivers of change. 'Agents of change' are young people with the potential to build a 'bridge' between those of different orientations and act as opinion formers. Interventions focused on young people should include a process for identifying and strengthening these motivations as they are key factors that guide, nurture, and ensure mobilization and resilience and provide a living and active meaning to transformative processes.
- *Apply mediation strategies to facilitate understanding and the search for solutions.* Through discussion and interaction dynamics, invite young people to reflect on values, motivations, and objectives in context. Mediation encourages awareness in a practical context and hones their ability to cope with the challenging issues from their own understanding and willingness to participate. Interventions that emphasize co-creation processes and collective management are especially promising.
- *Develop languages and communication approaches to promote dialogue and mobilization.* Communication strategies in this field must provide opportunities to hear what young people have to say. In a dynamic and open communication approach, it is possible to create contexts to transform perceptions, views, demands, and desires of young people in practical factors of mobilization and expression. The communication created 'by the young, for the young' is a highly creative factor, given the impact that can generate in terms of stimulus, participation, and representativeness. This is a key factor to the success of sustainable initiatives in this field.

### **The potential of design-based approaches to promote a culture of sustainability<sup>2</sup>**

Preliminary findings also show that design-based participatory approaches integrated

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<sup>2</sup> This section presents preliminary findings on the in-progress PhD research, reported on Mouchrek (2017).

in educational settings offer excellent opportunities to both engage youth in sustainability and support their positive development.

Participatory design emphasizes design as a social process founded on the democratic philosophy of mass participation in decision-making processes (Luck 2003). This approach is therefore well-suited to support social change and engagement in sustainability. Participatory design engages participants through strategies of collective construction of knowledge, prototyping, iteration and co-creation activities, among others. Co-design activities stimulate systemic thinking, encourage people to participate, reveal possibilities of doing things, empower people to act as active citizens providing self-sustaining and self-regenerating solutions, and build trust, an essential ingredient for bringing about any real change (Fuad-Luke, 2010).

Participatory approaches in design use activity-based co-design engagements (Martin & Hanington 2012), which might help capture students' visions about the transition to sustainability, by integrating their tacit knowledge, intrinsic motivations, and embedded perspectives. It also offers opportunities for students to collaboratively reflect and work to envision possible futures in multiparty collaboration processes.

This research also shows that co-creation activities are suited to develop a culture of sustainability among youth (Mouchrek 2014), since they contribute to:

- developing critical thinking to analyze complex problems and find innovative solutions;
- providing fields of experimentation for students to create solutions from their own resources and motivations;
- by offering a range of tools and forms of intervention, students learn collaboratively how to select and apply;
- developing concrete and action-oriented projects;
- and establishing a dynamic system in which feedback and confirmation stimulate new cycles of project and applied action.

Considering potential design-based strategies for engaging youth in sustainability, our research (Mouchrek 2017) shows that:

- Participatory design processes can provide spaces for experimentation, inviting youth to enact and reflect on their choices in a non-serious, playful environment.
- From the perspective of development, participatory design processes can offer opportunities for peer interaction, equal participation with adults, exploration of diverse identities, and elaboration of possible futures.
- Participatory processes can improve youth's ability to understand and contribute to (trans)forming their life contexts and exercising skills for protagonism and positive intervention (youth as co-creators of public space).

- Open, participatory environments are ideal to enable young people to exercise their critical and creative thinking skills and help them reflect on values and choices while creating and confirming their own principles.
- The integration of design-based thinking in the classroom opens opportunities to develop structured reflection and critical consciousness, both precursors of an intentional and active engagement with sustainability.
- If design competencies are combined with a discussion focused on sustainability, the impact in the learning process is expanded, allowing students to articulate their values and discuss potential strategies for application.
- Introducing tools and strategies from design-based thinking in the classroom allows students to learn practical skills that will be useful in their engagement in sustainability and social change in the community (such as graphic design, multimedia, verbal and visual expression, teamwork, etc).

### **Final considerations**

Design proved to be a good methodology for intervention for youth engagement in sustainability, both as a way to understand the problem (as a way of knowing and inquiring) and to attain goals (participatory approaches). Design-based activities are opportunities for experimentation that can both engage youth in sustainability and support their integral development.

The proposed guidelines for strategies in this field reinforce the importance of understanding the values and challenges of youth development. These can broaden and deepen the concept of sustainability, bringing it closer to student realities, building contexts for transformation, stimulating empowerment and the development of autonomy, seeking possible languages and communication approaches, and using mediation strategies to facilitate change processes conducted by young people themselves. The relationship between youth and engagement in sustainability and its implications for the future is a relevant theme of study, research and development in the field, especially in higher education. We must investigate the potential processes of learning, socialization, and innovation that will support and encourage sustainable choices, engagement, and social change among young people. This research aims to contribute to the advancement of knowledge about youth and sustainability and to the improvement of youth wellness and development, proposing novel processes and methodologies based in the interdisciplinary construction of knowledge.

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